REMARKS

Prior to a formal examination of the above-identified application, acceptance of the new claims and the enclosed substitute specification (under 37 CFR 1.125) is respectfully requested. It is believed that the substitute specification and new claims will facilitate processing of the application in accordance with M.P.E.P. 608.01(q). The substitute specification and new claims are in compliance with 37 CFR 1.52 (a and b) and, while making no substantive changes, are submitted to conform this case to the formal requirements and long-established formal standards of U.S. Patent Office practice, and to provide improved idiom and better grammatical form.

The enclosed substitute specification is presented herein in both marked-up and clean versions.

STATEMENT

The undersigned, an attorney registered to practice before the office, hereby states that the enclosed substitute specification includes the same changes as are indicated in the mark-up copy of the original specification. The substitute specification contains no new subject matter.

Respectfully submitted,

Joseph V. Coppola, Sr.
Registration No. 33,373
Rader, Fishman and Grauer PLLC
39533 Woodward Ave., Suite 140
Bloomfield Hills, Michigan 48304
(248) 594-0650
Attorney for Applicants
CUSTOMER NO. 010291

Sub Spec marked-up copy

CANDLE AND A METHOD FOR PRODUCING A CANDLE

[Description]

TECHNICAL FIELD

The invention relates to a candle with a container, which contains a transparent gel wax and at least one wick and the melting point of which is higher than that of the gel wax, an inlay being inserted into the gel wax and to a method for producing a candle.

BACKGROUND OF THE INVENTION

A candle based on a gel wax generally comprises a container that stabilizes the gel wax and is restricted in terms of its shape since the candle requires a sufficient quantity of combustion air at its bottom end also. Thus it is not possible for the diameter of the container to be reduced arbitrarily while at the same time making its height arbitrarily great, for example. Moreover, the containers for holding the gel wax are generally produced from transparent glass in order to ensure that the candle makes a visually pleasing impression. However, the glass cannot be shaped arbitrarily at a cost that is acceptable for such a product, for which reason use is generally made of cup-shaped glass containers, which do not, however, strike the observer of a candle of this kind as particularly attractive.

In order to make a candle with a glass container filled with gel wax visually appealing, one known practice is to encapsulate a very wide variety of products as so-called inlays into the transparent gel wax. Sand, shells, small stones, pieces of metal and other natural materials are used as decorative inlays in such candles, for example. However, these inlays interfere with the working of the candle as it

burns or melts down since they have a considerably higher melting point than the gel wax of the candle or are of a nature such that they burn and often give off unpleasant odors in the process.

US-A-4 568 270 discloses a candle with an external sleeve, an inner core and a wick, the core having an essentially lower melting point than the sleeve. The sleeve is produced from paraffin, wax or the like, and the core is produced from a gel wax, the melting point of the sleeve being in a temperature range between 139° and 145°F and that of the core being between 110° and 125°F.

DE 30 360 21 A1 has furthermore disclosed a candle with a container filled with transparent candle material, in which a wick and a bottom wax safety layer are furthermore provided. The wax safety layer is transparent and contains a thermoplastic polyamide resin and a solvent for the polyamide resin, this solvent being compatible with the material of the candle. The polyamide resin and the solvent are chosen so that the wax safety layer has a higher viscosity and melting temperature than the material of the candle.

Derwent Ref. 1971-63941S has moreover disclosed a candle based on paraffin, stearin and ceresin, which is coated with a wax blend containing a higher proportion of ceresin than the basic blend. This coating prevents wax from dripping when the candle is burning for a prolonged period.

EP 0 401 395 A1 has furthermore disclosed a candle based on wax with a wick and a casing, the combustible insert of which is composed of a wax with a melting point between 52°C and 56°C and the casing of which is composed of a wax material with a melting point between 74°C and 78°C.

WO-A-98 17243 has furthermore disclosed a transparent candle composed of a gel wax with a wick and an outer sleeve composed of polyamide.

Finally, WO-A-97 08282 and DE-A-30 36 021 have disclosed candles that comprise a gel wax, a wick and a transparent container, with an inlay being inserted into the gel wax according to WO-A-97 08282.

It is the object of the invention to create a candle and a method for producing a candle of the type stated at the outset, which is economical to produce and at the same time achieves a special visual effect.

According to the invention, the object is achieved by virtue of the fact that the inlay is designed as a printed film, the melting point of the film being in a range in which the film melts with the gel wax as the candle burns down.

[According to the invention, the object is achieved by virtue of the fact that the material of the container is a transparent polypropylene or a transparent polyethylene or a transparent plastic, each material having a melting point that is only slightly higher than the gel wax.

This measure results in a candle that melts completely as it burns down. As a result, the container holding the gel wax can be shaped in almost any desired way since the progressive melting of the container together with the gel wax as the candle burns down ensures that the flame always receives an adequate supply of combustion air. Moreover, the fact that the candle flame can always be seen directly ensures an appealing visual effect. As the gel wax progressively melts, the flame is not concealed by the container and is thus always visible to the observer. The melting and burning behavior of the materials used for the container is largely unproblematic and

these materials furthermore allow economical production of the container in almost any desired shape. Moreover, the transparency of the material of the container produces reflections that can be seen by the observer as the candle burns down and these have a positive effect on the overall aesthetic impression made by the candle. Thanks to the reflections, the entire candle becomes a gleaming object for the observer as it burns down.

The material of the container preferably contains additives. The additives promote largely unproblematic melting and burning behavior of the transparent plastics of the container.

The material of the container expediently contains colored pigments. These colored pigments can be arranged either in isolated areas or over a large area in the material of the container.

The container is preferably printed with printing inks. Printing the container allows information to be imparted to the observer of the candle, the printing inks melting away or burning almost without residues together with the container as the candle burns down.

As an alternative, the object is achieved in the case of a candle of the type stated at the outset, in which the container is transparent and an inlay is additionally inserted into the gel wax, by virtue of the fact that the inlay is designed as a printed film, the melting point of the film being in a range in which the film melts with the gel wax as the candle burns down.]

By virtue of the film, which is printed in any desired manner and is embedded in the gel wax, the observer is provided with a visually appealing candle. Since the film and the printing inks melt in the container together with the gel wax of the

candle as the candle burns down, the burning of the candle is not hindered by interfering objects. In this case, the film can be designed as a decoration or as an information medium.

The film is preferably composed of a polypropylene, a polyethylene or a correspondingly suitable plastic. The film and/or the printing inks are expediently transparent. This results in refraction of the light as the candle burns down, giving an atmospheric effect for the observer of the candle.

As an alternative, the object is furthermore achieved in the case of a candle of the type stated at the outset, in which the container is transparent and an inlay is additionally inserted into the gel wax, by virtue of the fact that the inlay is designed as a printed film, which is produced from a cellulose impregnated, coated and/or printed with additives.

The additives used essentially determine the combustion behavior of the cellulose, it also being possible, of course, to use paper or similar materials for the inlay in addition to pure cellulose.

The film and/or the printing inks are expediently transparent. In combination with the transparent container and the likewise transparent inlay, this results in enchanting visual effects as the candle burns down.

The film is advantageously arranged adjacent and parallel to the wick in the gel wax. While the candle is burning, the film is thus in the direct vicinity of the flame, thereby ensuring good combustion or reliable melting of the film and the printing inks.

To improve the melting behavior of the film, the film is fixed adjacent and in parallel between two wicks in the gel wax. Owing to the thinness of the film, the two wicks are

immediately adjacent to one another, for which reason they burn down with a common flame.

In order to achieve a film with a relatively large surface area, the film is expediently arranged in the gel wax in the form of a three-dimensional body that surrounds the wick with a clearance. The film is preferably in the form of a hollow cylinder, a rosette or the like. A self-stabilizing shape of this kind can be produced by the folding and stamping technique referred to as origami, for example.

According to an alternative configuration of the idea behind the invention, the film assumes the form of a helix together with two associated wicks within the gel wax. This results in a very decorative effect for the observer of the candle.

The film is preferably perforated. When the candle is burning, this measure means that the now liquid gel wax can flow through the perforations in the film, for which reason the film does not represent a division within a pool of wax that is present, and the pool of wax has a flat surface.

To intensify the light effects that occur as the candle burns down, the container is expediently provided with a structure on the inside and/or outside. Owing to this structure, corresponding light reflections occur as a function of the configuration of the structure as the candle burns down.

As an alternative, the object is furthermore achieved in the case of a candle of the type stated at the outset, in which the container is transparent and an inlay is additionally inserted into the gel wax, by virtue of the fact that the inlay is a prismatic or specially shaped body, the melting point of the body being in a range in which the body melts with the gel wax as the candle burns down.

By virtue of its shaping, the body present in the gel wax of the candle achieves a particularly attractive visual effect on the observer, especially when the candle is burning. The refraction of light brought about by the body results in impressive reflections, which radiate far into the room when it is dark. The body can be prefabricated in appropriately large numbers, thereby making the individual candle economical to produce.

The material of the body is expediently a polypropylene, a polyethylene, a correspondingly suitable plastic or a wax, in particular a gel wax. The body is furthermore expediently transparent and has an opening that accommodates the wick with a clearance. The body is thus arranged in the immediate vicinity of the flame when the candle is burning and emits the reflected candle light through the transparent gel wax.

As an alternative, the object is furthermore achieved in the case of a candle of the type stated at the outset, in which the container is transparent and an inlay is additionally inserted into the gel wax, by virtue of the fact that the inlay is arranged as a body that will not burn down in the vicinity of the surface of the candle, surrounding the wick with a clearance over a certain area, the body having a height that corresponds approximately to the depth of a pool of wax present when the candle is burning.

The pool of wax protects the body from excessive heating when the candle is burning. As the burning of the candle progresses, the body also falls and thus always surrounds the associated wick. Deliberate bundling or scattering of the radiation of the candle when the latter is burning can be achieved through the shape of the prism. The alignment of the radiation is expediently influenced by the body having facets on its outer surface. The facets can be produced either during

the shaping of the prism during its production or can be subsequently machined into the outer surface.

In an alternative embodiment, the body is designed as a perforated disk or as a prism and, as the candle burns, the body rests on the base of the pool of wax which is then present. The body is advantageously produced in the form of a prism or of a perforated disk of glass or a suitable plastic.

In order to increase the appealing visual effect of the candle even further, the body is preferably printed with printing inks. The wick or wicks is or are expediently of colored design.

In a method for producing a candle with a transparent container, which contains a transparent gel wax, at least one wick and at least one inlay, the object is achieved according to the invention by virtue of the fact that
- a certain quantity of the heated gel wax is introduced into a negative mold of one region of the container,
- once the gel wax has cooled, at least one inlay is placed on the gel wax,
- the wick is placed in an aligned manner on or in the inlay,
- the negative mold is completely filled with gel wax,
- once the gel wax has cooled, the negative mold is removed and the gel-wax block thus formed is inserted into the container, and the remaining free space is filled up with gel wax.

By means of these measures, it is possible to produce a relatively large number of gel-wax blocks that stabilize the individual inlay, thereby allowing efficient and economical preparation in appropriate numbers for the candle. These pre-prepared gel-wax blocks can be stored and poured into a container in a subsequent step of the method, it being possible to use containers of different shapes. The inlay can

be encapsulated in the gel-wax block with a spacing relative to the bottom of the candle, for example.

According to a preferred refinement of the idea behind the invention, a plurality of gel-wax blocks is inserted into the container and the remaining free space is filled up with gel wax. A candle with a plurality of inlays is thus made available, each inlay being fixed in a separate gel-wax block during the production process.

A film with printing inks is advantageously encapsulated as an inlay in the gel-wax block, their melting points corresponding at least approximately to the melting point of the gel wax. Thanks to the stabilizing effect of the gel-wax block, the film is relatively simple to handle during the production of the candle, after being encapsulated in the block.

It is self-evident that the features mentioned above and those that will be explained below can be used not only in the respectively indicated combination but also in other combinations without departing from the scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[The invention is explained in greater detail below by means of a number of exemplary embodiments with reference to the associated drawings, in which:]

Fig. 1. shows a front view of a candle according to the invention,

Fig. 2. shows an illustration of the candle shown in Fig. 1 in a partially melted state,

Fig. 3. shows a sectional illustration of a candle in a first alternative embodiment,

Fig. 4. shows an illustration of the candle shown in Fig. 2 in a partially melted state,

Fig. 5. shows a sectional illustration of a candle in a second alternative embodiment, and

Fig. 6. shows an illustration of the candle shown in Fig. 5 in a partially melted state, and

Fig. 7. shows a section through a negative mold for producing a gel-wax block for the candle shown in Fig. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The candle shown in Figs 1 and 2 comprises a container 1, which contains a wick 2 and a transparent gel wax 3. The thin-walled container 1 is composed of polypropylene, which contains colored pigments 4 of various densities. Once the wick 2 has been ignited, a flame 5 burns, causing the gel wax 3 to melt. Owing to the temperature generated by the flame, the container [1]7 also melts at the same time as the gel wax 3. As the candle burns down, the upper edge 6 thus projects only to an insignificant extent above the gel wax 3, and the flame 5 is fed continuously with a sufficient quantity of combustion air from the surroundings, for which reason the original container [1]7 can be shaped in almost any desired manner. The simultaneous melting of the gel wax 3 and the container [1]7 has a special visual effect for the observer of the candle, this effect being intensified by the fact that the container [1]7 is transparent.

According to Figs 3 and 4, the candle comprises a transparent container 7, which is preferably composed of glass and accommodates the wick 2, the transparent gel wax 3 and an inlay designed as a film 8. The film 8 is printed with printing inks 9 and is composed of a polypropylene. Once the

wick 2 has been ignited, the candle flame 5 burns, and the gel wax 3 within the container 7 melts owing to the prevailing temperature. Since both the film 8 and the printing inks 9 have a similar melting point to the gel wax 3, they likewise melt. Since the gel wax 3, the film 8 and the printing inks 9 all melt together, the candle is not hindered from burning down and melts uniformly down to the bottom 10 of the container 7.

The candle shown in Figs 5 and 6 comprises a body 13, which has in its center an opening 14 to accommodate the wick 2 with a clearance and is designed as a prism. The upper edge 15 of the body 13 is just below the surface 16 of the gel wax 3. Once the wick 2 has been ignited, the flame 5 burns, whereupon a pool 17 of gel wax 3 forms. The height of the body 13 corresponds approximately to the depth of the pool 17 of wax. Owing to its density, the body 13 remains on the surface 18 of the pool 17 of wax at all times and is thus always completely enclosed by the gel wax 3, for which reason it is protected from a buildup of heat that would cause it to melt.

To stabilize the candle inlay comprising the film 8 for the production of the candle, the film 8 is encapsulated in a gel-wax block 11 (Fig. 7), which corresponds to one region of the container 7. For this purpose, use is made of a negative mold 12, which corresponds to the region of the container 7 in which the gel-wax block 11 is to be arranged. A certain quantity of the heated gel wax 3 is introduced into the negative mold 12 and is then cooled until it solidifies. The printed film 8 is then placed on the gel wax 3, and the wick 2 is placed on the film 8. Once the wick 2 has been aligned, the negative mold 12 is completely filled with liquid gel wax 3. Once the gel wax 3 has cooled, the gel-wax block 11 is removed from the negative mold and inserted into the container 7 in an aligned manner. The free space that remains within the container 7 is then completely filled up with gel wax 3.

CANDLE AND A METHOD FOR PRODUCING A CANDLE

[Abstract]

ABSTRACT OF THE DISCLOSURE

The invention relates to a candle with a container [(1)], which contains a transparent gel wax (3) and at least one wick [(2)] and the melting point of which is higher than that of the gel wax [(3)]. The material of the container [(1)] is a transparent polypropylene or a transparent polyethylene or transparent plastic, each material having a melting point that is only slightly higher than the gel wax [(3)]. The material of the container [(1)] can contain colored pigments [(4)].

[(Fig. 3)]